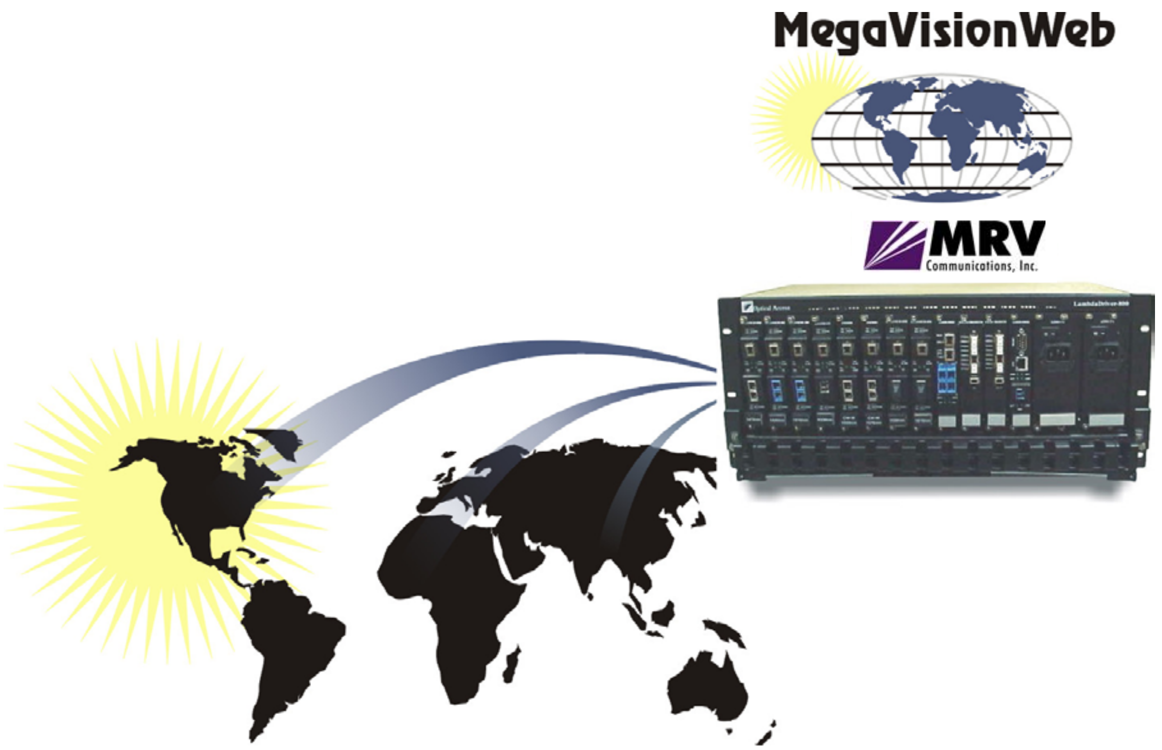
MegaVision

LambdaDriver Management

User Guide



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About this Guide

Scope

This guide shows how to manage any of the series of LambdaDrivers (e.g., LambdaDriver 400, LambdaDriver 800, LambdaDriver 1600) using *MRV'*s MegaVision® network management application.

Audience

This guide is intended for the use of network administrators who have working knowledge of SNMP management.

Related Documents

- ***MegaVision NMS Application User Manual***
  This manual describes how to install and use the MRV's MegaVision NMS Application.
- ***MegaVision LambdaDriver Release Notes***
  This document contains information not found in the User Guide and/or overriding information, and is produced if warranted.

Organization

For customer convenience, the management description is organized according to the service architecture of the MegaVision Application GUI which is hierarchical. Accordingly, management is described on the following four levels:

Map level – The LambdaDriver is represented by an identifying icon in the network map and is manageable as a network element.

Device level – The LambdaDriver is represented by an identifying live image and is manageable as a single entity.

Module level – A module of the LambdaDriver is represented by an identifying live image and is managed as an individual entity.

Port level – A module port of the LambdaDriver is represented by an identifying live image and is managed as an individual entity.

Typographical Conventions

The typographical conventions used in this document are as follows:

Convention	Explanation
`CourierBold`	This typeface represents information provided by/to the system.
Italics	This typeface is used for emphasis.
Enter	This format represents the key name on the keyboard or keypad.
	This icon represents important information.
	This icon represents risk of personal injury, data loss, or system damage.

Acronyms

ARP	Address Resolution Protocol
ATM	Asynchronous Transfer Mode
BER	Bit-Error Rate
CLI	Command Line Interpreter
CTS	Clear To Send
CWDM	Coarse Wavelength-Division Multiplexing
dB	deciBel
DCD	Data Carrier Detect
DNS	Domain Name System/Service
DSR	Data Set Ready
DTR	Data Terminal Ready
DWDM	Dense Wavelength-Division Multiplexing
Gnd	Ground
GUI	Graphical User Interface
IP	Internet Protocol
ISP	Internet Service Provider
ITU	International Telecommunications Union
LAN	Local Area Network
MAN	Metropolitan Area Network
MDI	Media Dependent Interface
MDI-X	Media Dependent Interface with cross-wiring
NMS	Network Management Station
OA	Optical Amplifier
OADM	Optical Add-Drop Multiplexer
OID	Object IDentifier
OSC	Optical Service Channel
RARP	Reverse ARP
RI	Ring Ignore
RMON	Remote MONitoring
RTS	Request To Send
RxD	Receive Data
SDH	Synchronous Digital Hierarchy
SNMP	Simple Network-Management Protocol
SONET	Synchronous Optical Network
TDM	Time-Division Multiplexer/Multiplexing
TELNET	(dial-up) TELephone NETwork (connection protocol)
TFTP	Trivial-File Transfer Protocol
TxD	Transmit Data
UPS	Uninterruptible Power Supply
URL	Universal Resource Location
WAN	Wide Area Network
WDM	Wavelength-Division Multiplexing

LambdaDriver Overview

General

The LambdaDriver is a multi-functional modular wavelength-division multiplexer that can operate in DWDM and CWDM modes. Model 400 can create as many as four virtual fibers (channels[1]) on a *single* physical fiber. Model 800 can create as many as eight virtual fibers on a *single* physical fiber. Model 1600 can create as many as sixteen virtual fibers on a *single* physical fiber. Each virtual fiber is fully independent of the others and can carry data at the same rate as a physical fiber.

LambdaDriver is architectured as a scalable system that can be expanded and enhanced simply by inserting pluggable modules.

The basic LambdaDriver consists of a chassis and the following modules: Mux and Demux (1 each) or OADM (1); Transponders (1 per virtual fiber); Power Supply (1).

LambdaDriver can be scaled up by inserting the following modules: Additional Transponders (up to 4 for LambdaDriver 400, 8 for LambdaDriver 800, and 16 for LambdaDriver 1600); ESCONs (1 per physical or virtual fiber), Management (1); Service (1); 1+1 Protection (1); OA (1 or 2); GM2 Gigabit Ethernet Multiplexers (1 per physical or virtual fiber), Redundant Power Supply (1).

The chassis and modules are described in the section *Components*, just below..

Components

Chassis

The chassis is a host for up to *six* (for LambdaDriver 400) / *twelve* (for LambdaDriver 800) / *twenty-four* (for LambdaDriver 1600) pluggable network modules and up to two pluggable power supplies, and contains WDM support functionality. It can support various combinations of network modules to offer a wide range of applications.

Mux Module

Mux module multiplexes the *egress* channels[2] on the physical fiber.

Demux Module

Demux module demultiplexes the *ingress* channels[3] on the physical fiber.

Transponder Module

Transponder Module converts waves of one wavelength into waves of a different wavelength to match the access terminal equipment operating wavelength (850 nm or 1310 nm). It also performs the 3R[4] function.

A transponder module is required for each LambdaDriver channel.

Management Module

Management Module enables management by SNMP Manager, TELNET station, and Craft Terminal (VT100 terminal or emulator).

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[1] Data, voice, or video carrier wavelengths.

[2] Channels carrying data *out of* the LD800.

[3] Channels carrying data *into* the LD800.

[4] Reshape, re-time, re-transmit.

Service Module

Service Module provides a separate 1310 nm channel on the WDM trunk that is used for management of remote LambdaDriver nodes. The Service Module is needed only when it is required to manage a remote LambdaDriver which has no local connection to a Fast Ethernet network.

1+1 Redundancy Module

Redundancy Module is an interface for two fiberoptic cables for carrying identical data. The cables backup each other. The same information is transmitted on both fibers. Normally, the data on the primary link (cable connected to the Primary port) is received by the nodes. When the primary link fails (no reception is detected), the secondary link becomes the active link. The module also has full Service Module functionality.

OADM Module

OADM Module is a passive multiplexer that can add and/or drop a specific channel (wavelength) to/from an optical WDM signal, while all other channels are routed from the input to the output with minimal attenuation.

OADMs are normally used in Ring or Multipoint network topologies.

Power Supply Module

Power Supply Module powers the LambdaDriver. It is auto-adaptive in the range 90 to 260 Vac.

Redundant Power Supply Module

Redundant Power Supply Module is identical to the Power Supply Module. It backs up and is backed up by the Power Supply Module in the same LambdaDriver while equally sharing the power load.

Device Channels

CWDM

The LD 800 can be configured to support up to 8 CWDM channels (carrier wavelengths). Each channel can carry data at any rate in the range 10 Mbps to 2.7 Gbps. The channels span the wavelength range 1470 to 1610 nm with 20 nm spacing between the wavelengths.

DWDM

The LD 800 can be configured to support up to any of 8 DWDM channels (carrier wavelengths) from among 20 DWDM channels. Each channel can carry data at any rate in the range 10 Mbps to 2.7 Gbps. The channels span the wavelength range 1530.33 to 1560.61 nm with 1.6 nm spacing between the wavelengths.

Management

General

Hot Spots

A hot spot protrudes when the mouse cursor is moved to it. Clicking with the left mouse button in a hot spot causes a menu window to be opened.

Active Areas

An active area is a colored region indicating the status of the device, module, or port.

Access

The procedure for accessing the MegaVision application is as follows:

1. Double click the icon 

.
2. Follow the prompts until the login window (Figure 1) opens.



Figure 1: Login Window

3. Select the access level by clicking a dot in  against User or Supervisor. (Figure 1 shows that user-level is selected.)

4. In the Enter Password: field, either type the password or, if the default password was not changed, leave it empty. Click OK or press **Enter** key to open the Map Level window (Figure 2).

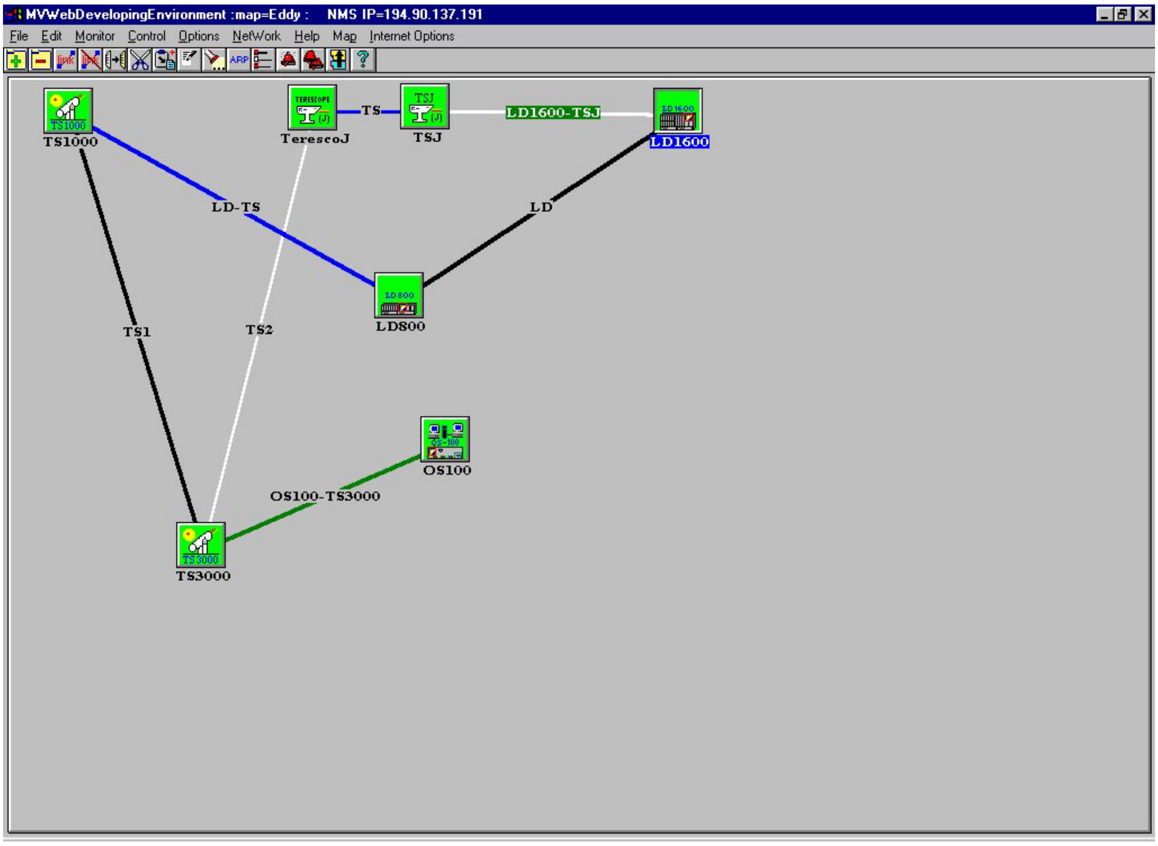


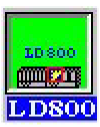
Figure 2: Map Level Window

Map level

Hot Spots & Active Areas

The hot spots and active areas that apply generically to devices are described in detail in the ***MegaVision NMS Application User Manual***.

The hot spot and active area that applies specifically to the LambdaDriver is described below.



Opens the LambdaDriver Device Level management window.

Green – Communication with SNMP host OK.

Blue – LambdaDriver powered on but is not SNMP manageable.

Red – Communication with SNMP host lost.

Gray – LambdaDriver turned off.

Adding an LambdaDriver

This section describes the procedures for manually and automatically adding an LambdaDriver image to the network map.

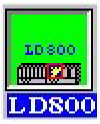
Manual Addition

In the manual mode, the administrator selects the device from the device/map list and adds it to the network map.

Auto discovery (Automatic Addition)

In the auto discovery mode, the system adds the device to the network map. The procedure for manual addition is as follows:

Device Level

To open the device zoom window (Figure 3), double click on 

in the map level window (Figure 2).

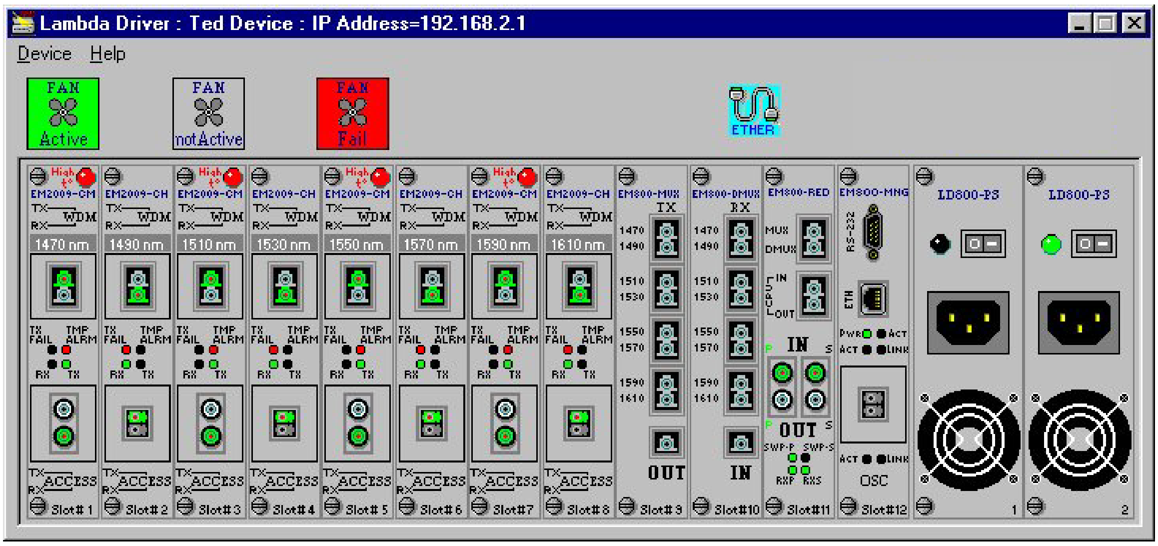


Figure 3: Device Zoom Window

Hot Spots

Device

Device Configuration

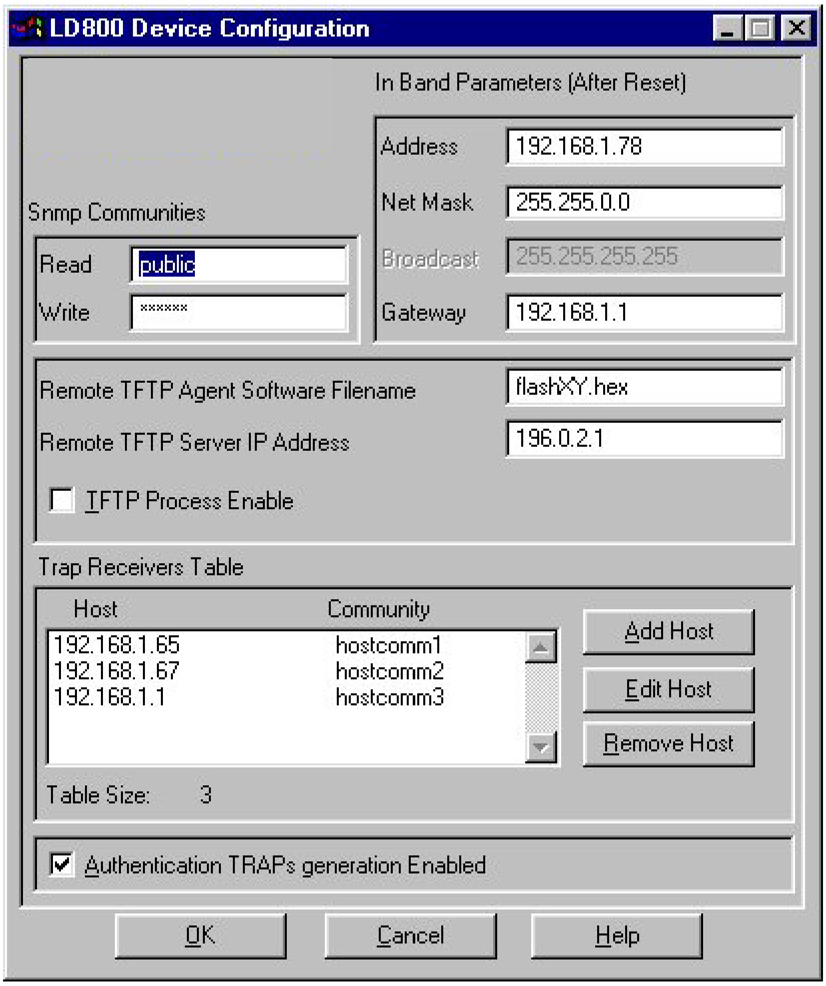
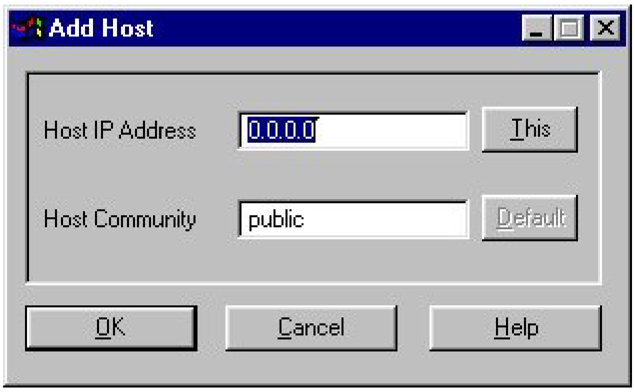
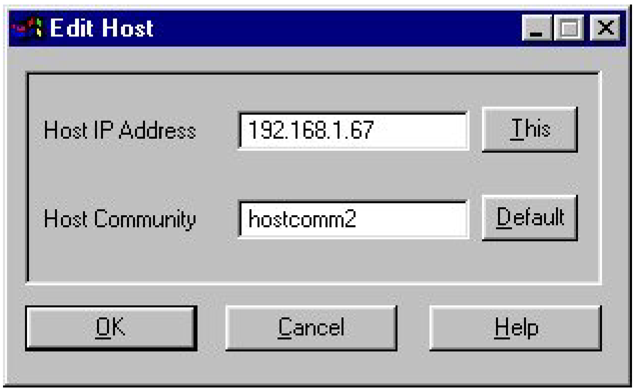


Figure 4: Device Configuration Window

Table 1: Device Configuration Window Fields and Tools

No.	Field/Tool	Function
1	In Band Parameters (After Reset)	Address – IP address of LambdaDriver agent. Net Mask – IP address of network mask for agent. Gateway – IP address "default gateway" node where packets should be sent in the absence of other routing information.
2	Snmp Communities	Read – Password for getting information on a specific SNMP setting of the LambdaDriver. Write – Password for changing a specific SNMP setting of the LambdaDriver.
3	Remote TFTP Agent Software Filename	Name of SNMP Agent software file to be downloaded.
4	Remote TFTP Server IP Address	IP address of TFTP server (relevant only if the TFTP Mode is *Client*).

5	☐ TFTP Process Enable	☑ – Enable the TFTP to function. ☐ – Disable the TFTP.
6	Trap Receivers Table	Host – IP address of host (destination station) for traps. Community – SNMP community string (name) of host for traps. Add Host – Open the window (shown below) for adding a host which is to receive traps from the LambdaDriver.  Host IP Address – IP address of a host to which traps will be sent from the LambdaDriver. This – Enter the IP address of the host with which you are accessing the LambdaDriver. Host Community – SNMP community string (name) of host for traps. Default – Enter the default host community, i.e., **`public`**. OK – Accept the changes in the window and close it. Cancel – Ignore the changes in the window and close it. Help – Get context-sensitive help. Edit Host – Open the window (shown below) for changing the host which is to receive traps from the LambdaDriver.

		 Host IP Address – IP address of a host to which traps will be sent from the LambdaDriver. This – Enter the IP address of the host with which you are accessing the LambdaDriver. Host Community – SNMP community string (name) of host for traps. Default – Enters the default host community, i.e., **`public`**. OK – Accept the changes in the window and close it. Cancel – Ignore the changes in the window and close it. Help – Get context-sensitive help. Remove Host – Open the window (shown below) for removing a host which is to receive traps from the LambdaDriver. 
7	Table Size:	
8	☑ Authentication TRAPs generation Enabled	☑ – Enable trap generation when a host makes a get or set set request to the LambdaDriver with a wrong community string. ☐ – Disable the TFTP.
9	OK	Accept the changes in the window and close it.
10	Cancel	Ignore the changes in the window and close it.

11	Help	Get context-sensitive help.

Device Information



Figure 5: Device Information Window

Table 2: Device Information Window Fields and Tools

No.	Field/Tool	Function
1	Product Type :	Type of device.
2	IP Address :	IP address of the LambdaDriver agent.
3	MAC Address :	MAC address of the LambdaDriver agent.
4	Created In:	Date and time of creation of the current LambdaDriver firmware.
5	Version	**Software** SoftWare : – The version of the LambdaDriver firmware. **Hardware** HardWare : – The version of the hardware of the LambdaDriver.
6	UpTime:	The time the LambdaDriver has been operating since the last reset.
7	Read Community Name:	The read-only community string for getting responses from the LambdaDriver.
8	Close	Ignore the changes in the window and close it.

Ping

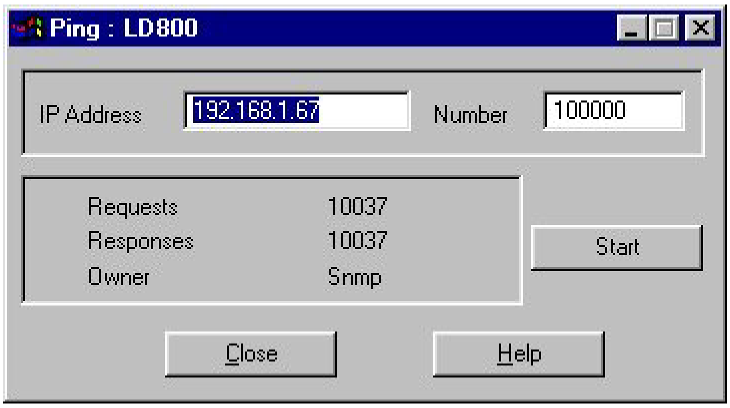


Figure 6: Ping Window

Table 3: Ping Window Fields and Tools

No.	Field/Tool	Function
1	IP Address	IP address of LambdaDriver.
2	Number	Number of pings to be performed.
3	Requests	Number of pings performed until now.
4	Responses	Number of responses to the pings until now.
5	Owner	Activator of the ping process.
6	Start	Start the ping process.
7	Close	Ignore the changes in the window and close it.
8	Help	Get context-sensitive help.

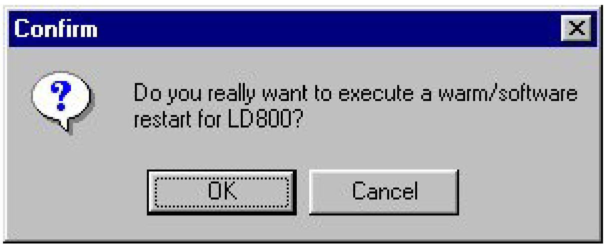


Figure 7: Warm Reset Window

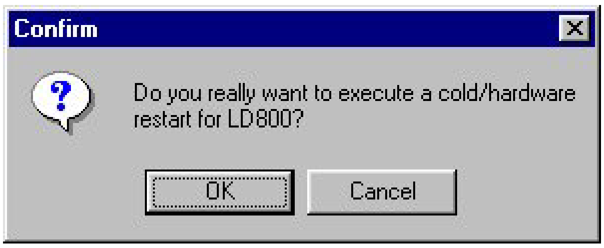


Figure 8: Cold Reset Window

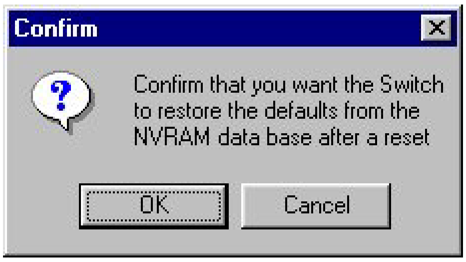


Figure 9: Initialize NVRAM Window

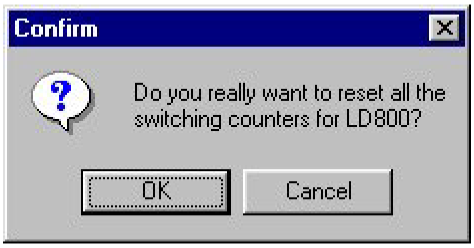


Figure 10: Reset Statistics Window

Describe

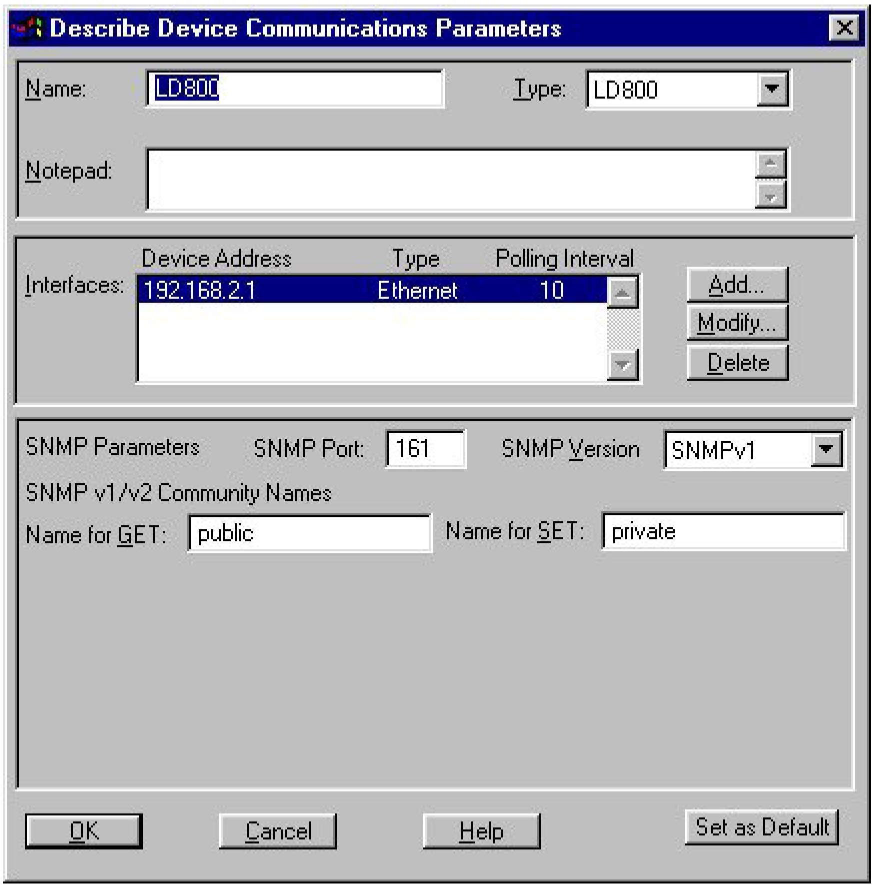
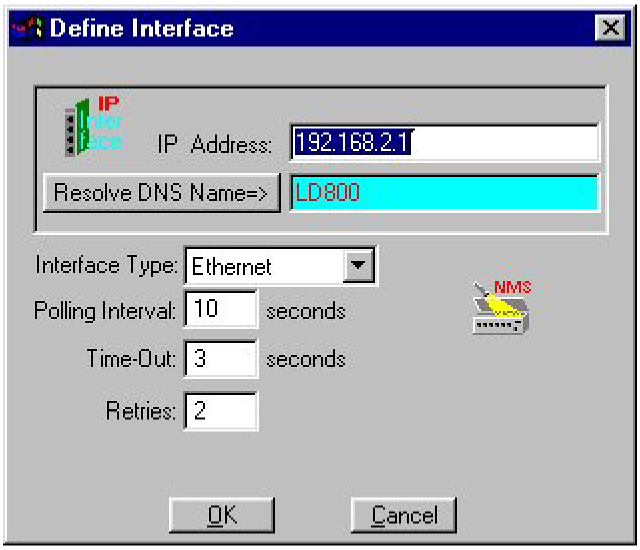


Figure 11: Describe Window

Table 4: Describe Window Fields and Tools

No.	Field/Tool	Function
1	Name:	Identity of LambdaDriver.
2	Type:	Type of device.
3	Notepad:	Area for typing remarks. (Stored in the MegaVision's database.)
4	Interfaces:	Device Address – IP address of the device's interface. Type – Type of interface (e.g., Ethernet, Token Ring, etc.) Polling Interval – The time (in seconds) the MegaVision polls the LambdaDriver. Add... – Open the window for adding an interface IP address which may be accessed by a host.  IP Address: – IP address of LambdaDriver agent. Resolve DNS Name=> – Request MegaVision to display the IP address associated with the DNS name of the LambdaDriver. Interface Type: – Type of interface (e.g., Ethernet, Token Ring, etc.). Polling Interval: – The time (in seconds) the MegaVision polls the LambdaDriver. Time-Out: – The wait time for a response from the LambdaDriver at the end of which the MegaVision decides failure of response. Retries: – The number of times the MegaVision attempts to get a response from the LambdaDriver. OK – Accept the changes in the window and close it.

		Cancel – Ignore the changes in the window and close it. Modify... – Same as for Add..., above, except that the window is used for modifying an interface IP address. Delete – Delete the selected row in the Interfaces: field.
5	SNMP Parameters	SNMP Port: – TCP/IP port at which SNMP data traffic enters and exits. SNMP Version – Current SNMP version. Clicking on the list box shows the selectable SNMP versions.
6	SNMP v1/v2 Community Names	Name for GET: – Get community string, i.e., Password for getting information on a specific SNMP setting of the LambdaDriver. Name for SET: – Set community string, i.e., Password for changing a specific SNMP setting of the LambdaDriver.
7	OK	Accept the changes in the window and close it.
8	Cancel	Ignore the changes in the window and close it.
9	Help	Get context-sensitive help.
10	Set as Default	Assign the settings in this window to new devices.

<u>Identify</u>

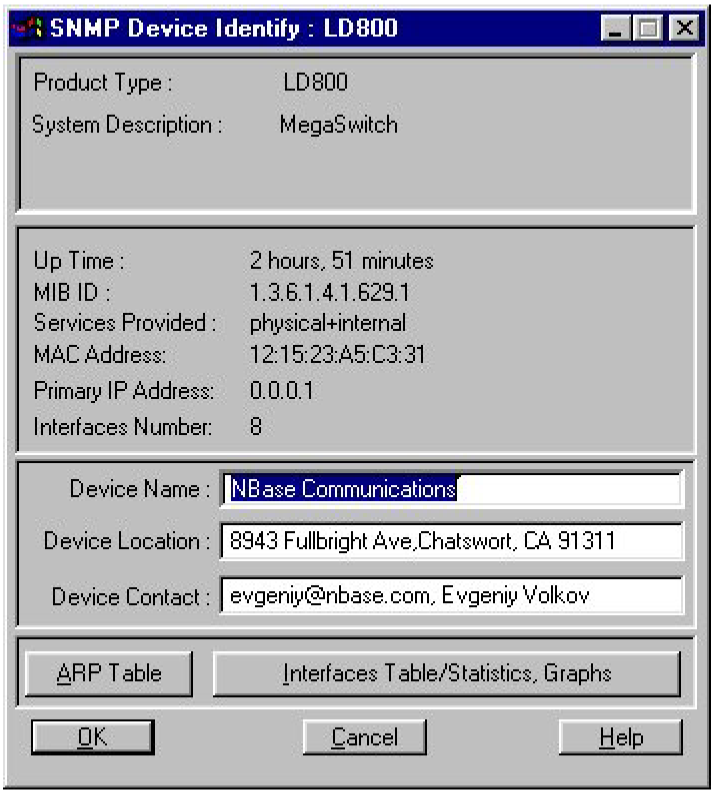


Figure 12: Identify Window

Table 5: Identify Window Fields and Tools

No.	Field/Tool	Function
1	Product Type :	Type of device.
2	System Description :	Description of the LambdaDriver.
3	Up Time :	The time the LambdaDriver has been operating since the last reset.
4	MIB ID :	ID of the current MIB.
5	Services Provided :	The set of services that is primarily offered.
6	MAC Address:	MAC address of the LambdaDriver agent.
7	Primary IP Address:	IP address of primary interface of LambdaDriver. (This is the first IP address that appears in the table of IP addresses for the LambdaDriver.)
8	Interfaces Number:	The number of SNMP accessible interfaces the LambdaDriver has.
9	Device Name :	Mnemonic for readily identifying the LambdaDriver unit. Verify or type in this information (no more than 255 characters).
10	Device Location :	Location of the LambdaDriver unit. Verify or type in this information (no more than 255 characters).
11	Device Contact :	Information on your contact agent for the LambdaDriver unit. Verify or type in this information (no more than 255 characters).
12	ARP Table	Open the ARP Table window (described in the Section *ARP Table*).
13	Interfaces Table/Statistics, Graphs	Open the Interfaces Table window (described in the Section *Interfaces Table*).
14	OK	Accept the changes in the window and close it.
15	Cancel	Ignore the changes in the window and close it.
16	Help	Get context-sensitive help.

<u>ARP Table</u>

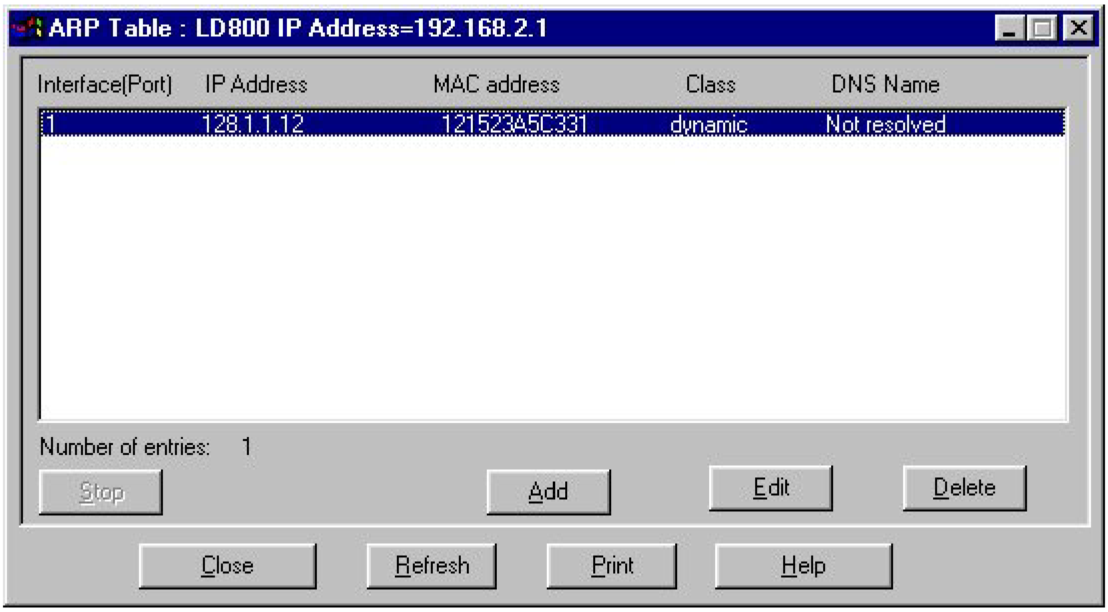
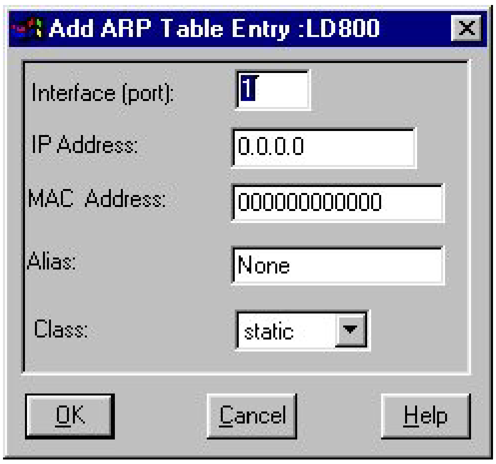
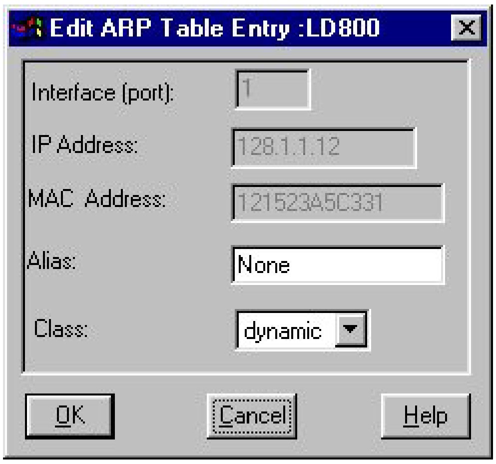


Figure 13: ARP Table Window

Table 6: ARP Table Window Fields and Tools

No.	Field/Tool	Function
1	Interface(Port)	Software interface/port number of the LambdaDriver.
2	IP Address	IP address of LambdaDriver agent.
3	MAC address	MAC address of the LambdaDriver agent.
4	Class	Whether the entry in the ARP table is dynamic (temporary, i.e., automatically removed by the MegaVision) or static (permanent, i.e., removable only by the operator).
5	DNS Name	Mnemonic for an IP address. The DNS knows how to find the associated IP address from the DNS name.
6	Number of entries:	Number of entries in the ARP Table.
7	Stop	Stops insertion of entries into the ARP table.
8	Add	Open the window (shown below) for adding an entry in the ARP Table. 

		Interface(Port) – Software interface/port number of the LambdaDriver. IP Address – IP address of LambdaDriver agent. MAC address – MAC address of the LambdaDriver agent. Alias: – Alias of the most significant bits of the MAC Address. Class – Whether the entry in the ARP table is dynamic (temporary, i.e., automatically removed by the MegaVision) or static (permanent, i.e., removable only by the operator). OK – Accept the changes in the window and close it. Cancel – Ignore the changes in the window and close it. Help – Get context-sensitive help.
9	Edit	Open the window (shown below) for editing an entry in the ARP Table. The window is the same as the Add ARP Table Entry window, above. 
10	Delete	Open the window for confirming deletion of the selected entry in the ARP Table.
11	Close	Ignore the changes in the window and close it.
12	Refresh	Update the ARP Table.
13	Print	Print the ARP Table.
14	Help	Get context-sensitive help.

Interfaces Table

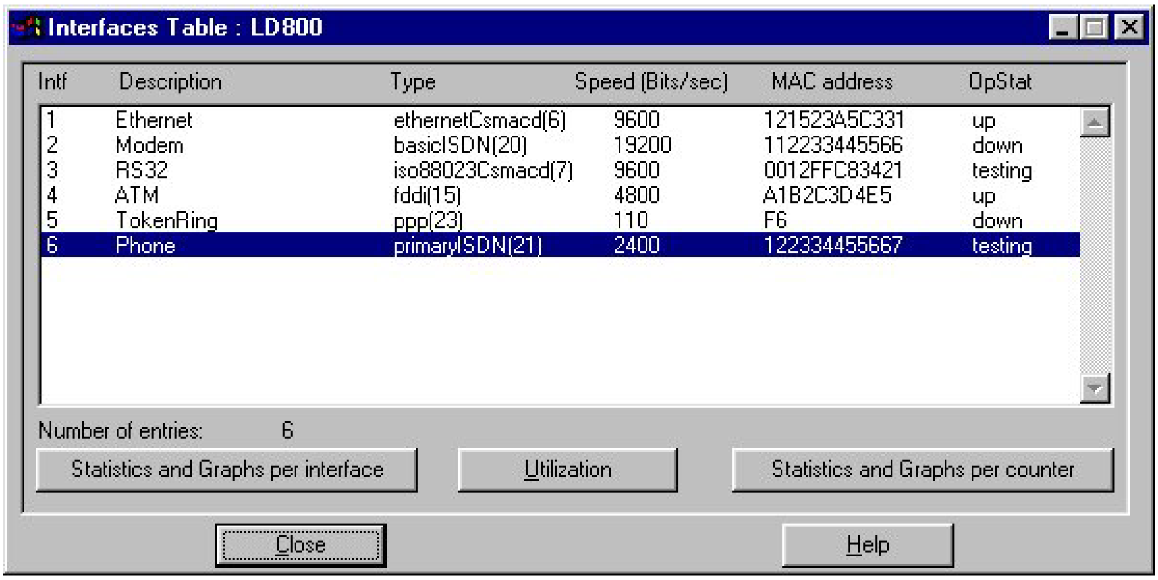
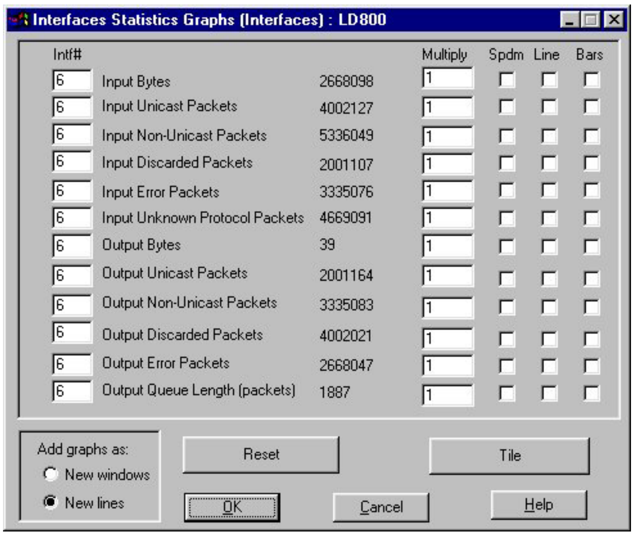


Figure 14: Interfaces Table Window

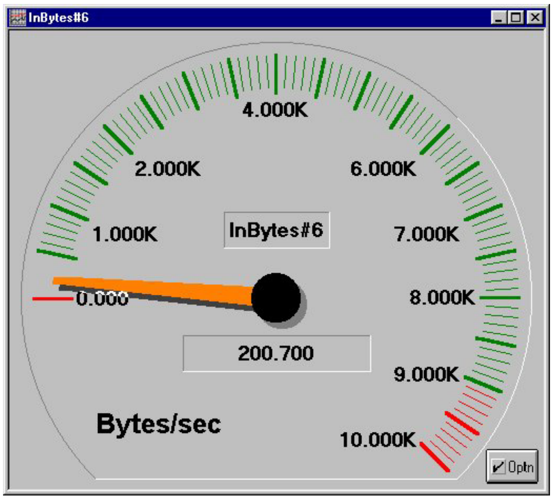
Table 7: Interfaces Table Window Fields and Tools

No.	Field/Tool	Function
1	Intf	ID (index) associated with an interface type.
2	Description	Interface type.
3	Type	OID of Interface type.
4	Speed (Bits/sec)	Operating speed of interface.
5	MAC address	MAC address of the LambdaDriver agent.
6	OpStat	Operation status of the LambdaDriver.
7	Number of entries:	Number of entries in the Interfaces Table.
8	Statistics and Graphs per interface	Open the window (shown below) showing the interface statistics and graphs.  Intf# – ID (index) associated with an interface type.

Number Column – The counts

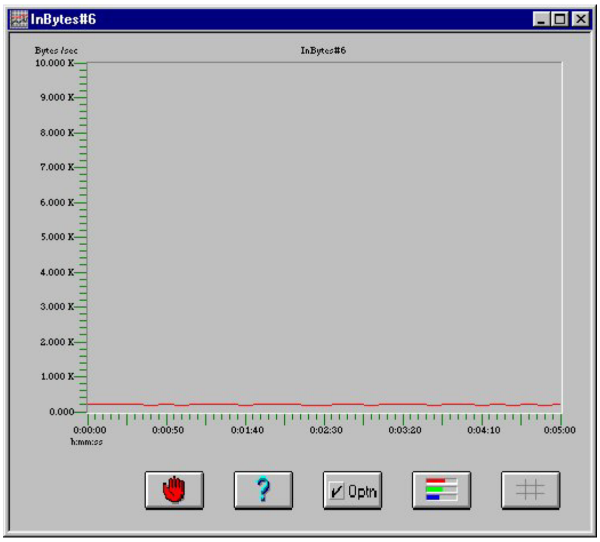
Multiply – Scale factor.

Spdm – Show a speedometer indicating the rate at which data enters the interface in Bytes/sec.



Line – Show a line graph indicating the rate at which data enters the interface in Bytes/sec as a function of time.

To display the total bytes and the elapsed time, click with the left mouse button.



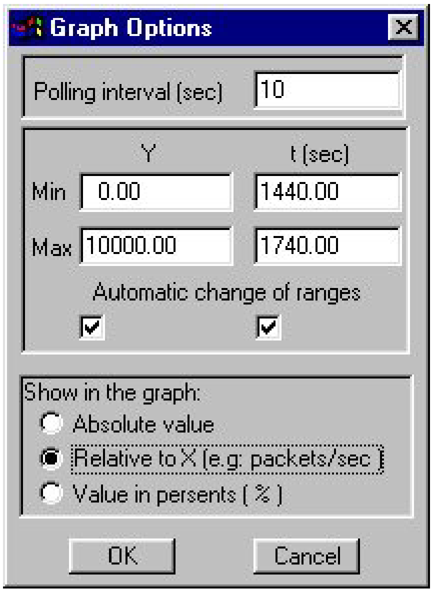
Bars – Show a bar graph indicating the rate at which data enters the interface in Bytes/sec.

To display the total bytes, click with the left mouse button.

 – Stop collection of additional statistical data.

 – Get context-sensitive help.

Optn – Show graph display options.



Polling interval (sec) – The time (in seconds) the MegaVision polls the LambdaDriver.

Y – Y-axis (Rate in bytes/sec)

t (sec) – X-axis (Time in seconds)

Min – Lower limit of range on Y-axis.

Max – Upper limit of range on Y-axis.

Automatic change of ranges – A check mark in the left box causes automatic scaling of the Y-axis for optimal display along the Y-axis. A check mark in the right box causes automatic scaling of the X-axis for optimal display along the X-axis.

Show in the graph: –

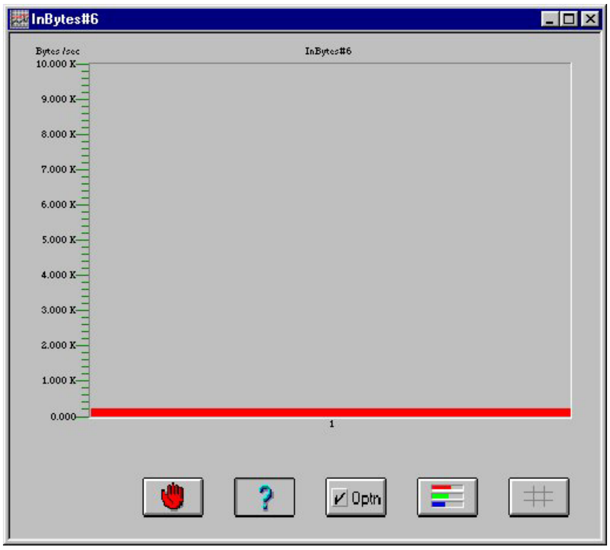
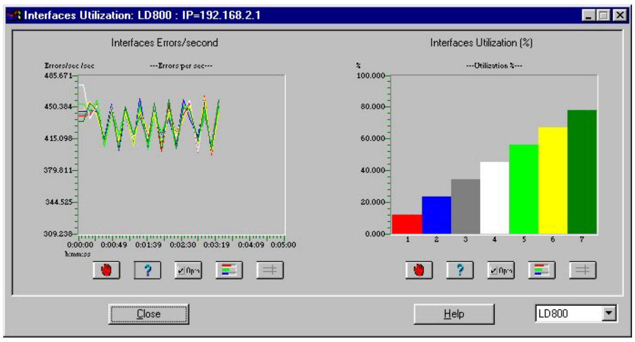
- Absolute value – The actual bytes/sec.
- Relative to X (e.g: packets/sec) – The change in the bytes/sec per sec.
- Value in persents (%) – The absolute value expressed as a percentage.

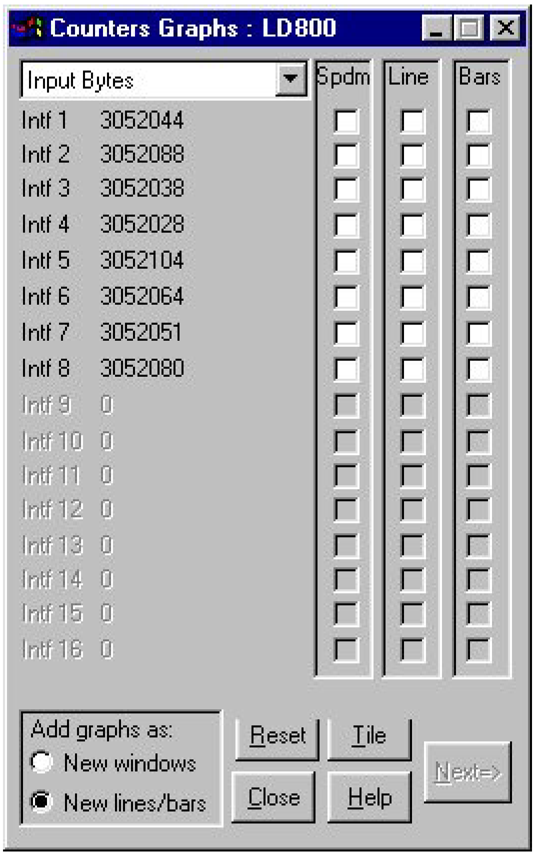
OK – Accept the changes in the window and close it.

Cancel – Ignore the changes in the window and close it.

 – Show legend.

 – Show grid on graph.

		 Add graphs as: – Reset – Reset count value display (not counters!) Tile – Reduce and rearrange the graph windows (for visual convenience). OK – Accept the changes in the window and close it. Cancel – Ignore the changes in the window and close it. Help – Get context-sensitive help.
9	Utilization	Open the window (shown below) showing the % utilization of the interface and interface errors. 
10	Statistics and Graphs per counter	Open the window (shown below) showing the interface counts and graphs.



Spdm – See Statistics and Graphs per interface, above.

Line – See Statistics and Graphs per interface, above.

Bars – See Statistics and Graphs per interface, above.

Add graphs as: – Store graphs as new windows

New windows – Use separate windows for each graph.

New lines/bars – Same window for one or more graphs.



Note

Avoid using New windows and New lines together.

Reset – Restart collection and display of statistical data.

Tile – Reduce and rearrange the graph windows (for visual convenience)..

Close – Ignore the changes in the window and

		close it. Help – Get context-sensitive help.
11	Close	Ignore the changes in the window and close it.
12	Help	Get context-sensitive help.

Alarm Log

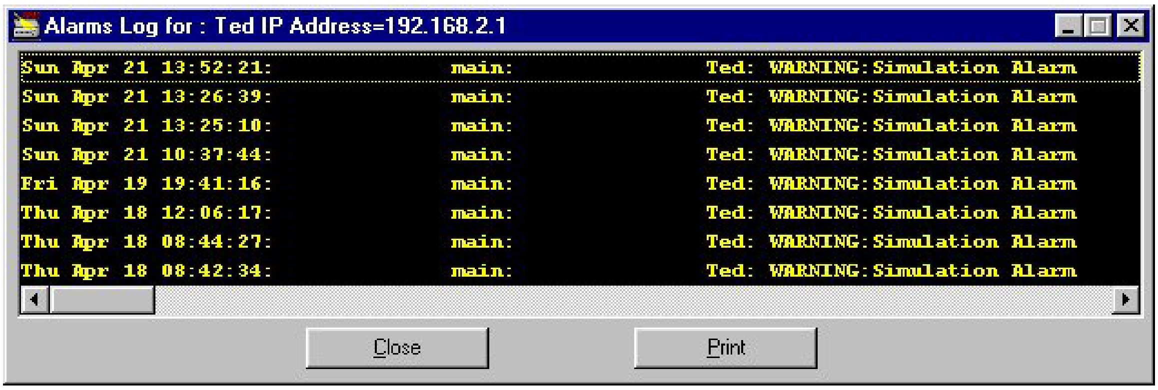


Figure 15: Alarm Log Window

Table 8: Alarm Log Window Fields and Tools

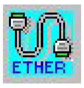
No.	Field/Tool	Function
1	Close	Ignore the changes in the window and close it.
2	Print	Print the Alarm Log.

Help

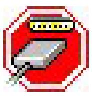
About . . . – Shows the software version of the MegaVision application.

Active Areas

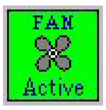
SNMP Communication



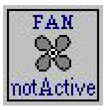
– SNMP Communication OK


– No SNMP Communication

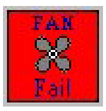
Fans



– Running



– Idle.



– Failed

Power Supply

Hot Spots

None.

Active Areas

Ports

Gray – Not informational.

LEDs

PWR	Green – Power distribution OK.
	Black – Power distribution faulty.

Transponder

Hot Spots

Clicking on the Transponder module opens the window shown in Figure 16.

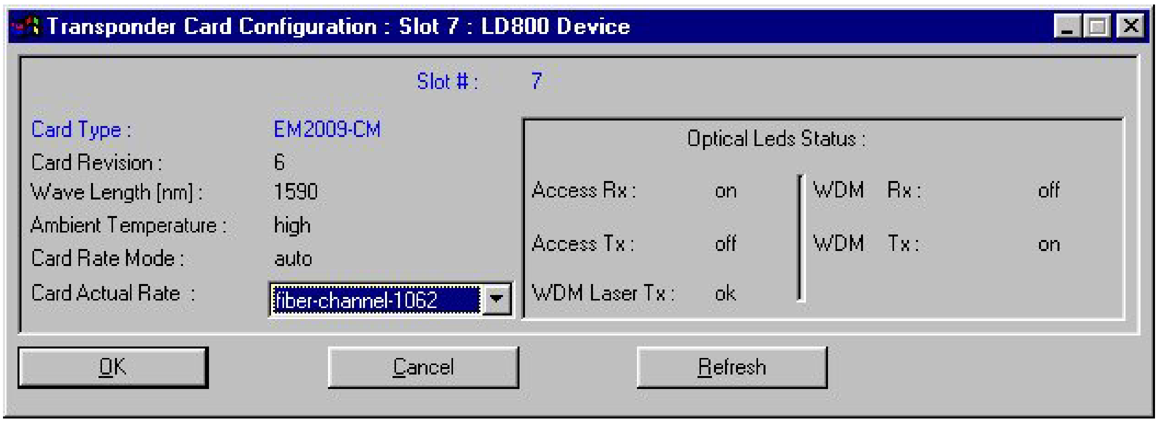


Figure 16: Transponder Module Window

Table 9: Transponder Module Window Fields and Tools

No.	Field/Tool	Function
1	Slot # :	The number of the slot in which the Transponder Module resides.
2	Card Type :	The type of the Transponder Module.
3	Card Revision :	The revision number of the Transponder Module.
4	Wave Length [nm] :	The transmission wavelength of the Transponder Module.
5	Ambient Temperature :	Ambient temperature of Transponder Module. The possible values are ***normal*** and ***high***.
6	Card Rate Mode :	Auto – Settable by management (software). Manual – Settable by DIP switch (hardware).
7	Card Actual Rate :	Data rate of the Transponder Module in Mbps.
8	Optical Leds Status :	Access Rx : – Reception at access port. The possible values are ***on*** and ***off***. Access Tx : – Transmission from access port. The possible values are ***on*** and ***off***. WDM Laser Tx : – WDM transmission laser status. The possible values are ***failed*** and ***ok***.

		WDM Rx: – Reception at WDM port. The possible values are ***on*** and ***off***. WDM Tx: – Reception at access port. The possible values are ***on*** and ***off***.
9	OK	Accept the changes in the window and close it.
10	Cancel	Ignore the changes in the window and close it.
11	Refresh	Update the ARP Table.

Active Areas

Ports

Green – Communication with SNMP host OK.

Blue – Port disconnected.

Red – Port faulty.

Gray – Not informational.

LEDs

ACCESS RX Green – Reception at access port OK.
Black – Reception at access port faulty.

WDM RX Green – Reception at WDM port OK.
Black – Reception at WDM port faulty.

TX FAIL Red – WDM Transmission laser faulty.
Black – WDM Transmission laser OK.

TMP ALRM Red – Module too hot.
Black – Module temperature OK.

Management

Hot Spots

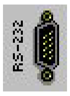
Clicking on the port  Management module opens the window shown in Figure 17.



Figure 17: Management Module Window

To open a TELNET session, click OK.

To revoke, click Cancel.

Active Areas

Ports

Green – Communication with SNMP host OK.

Blue – Port disconnected.

Red – Port faulty.

Gray – Not informational.

LEDs

PWR	Green – Power to module OK. Black – Power to module faulty.
MGT	Green – SNMP data flowing. Black – No SNMP data flowing.
ACT (Eth)	Green – Ethernet data flowing. Black – No Ethernet data flowing.
LINK (Eth)	Green – Ethernet link OK. Black – Ethernet link faulty.
OSC ACT	Green – Optical Service Channel data flowing. Black – No OSC data flowing.
OSC LINK	Green – OSC link OK. Black – OSC link faulty.

1+1 Redundancy

Hot Spots

Clicking on the Transponder module opens the window shown in

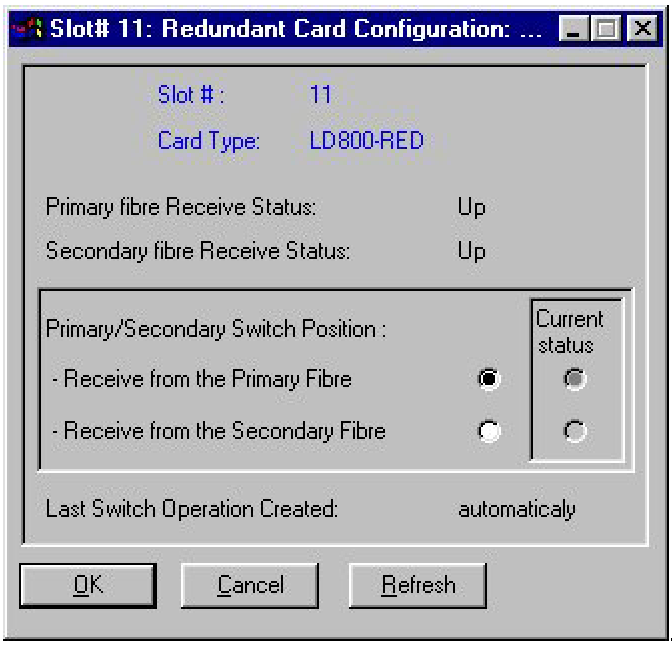


Figure 18: 1+1 Module Window

Table 10: 1+1 Module Window Fields and Tools

No.	Field/Tool	Function
1	Slot # :	The number of the slot in which the 1+1 Module resides.
2	Card Type:	The type of the 1+1 Module.
3	Primary fibre Receive Status:	Primary link receive fiber OK.
4	Secondary fibre Receive Status:	Secondary link receive fiber OK.

5	Primary/Secondary Switch Position :	- Receive from the Primary Fibre – Primary link fiber selected. - Receive from the Secondary Fibre – Secondary link fiber selected.
6	Current status	The fiber (primary or secondary) from which the LambdaDriver is currently receiving.
7	Last Switch Operation Created:	automaticaly How the last link switch was caused. The possibilities are: automatically or manually.
8	OK	Accept the changes in the window and close it.
9	Cancel	Ignore the changes in the window and close it
10	Refresh	Update the ARP Table.

Active Areas

Ports

Green – Communication with SNMP host OK.

Blue – Port disconnected.

Red – Port faulty.

Gray – Not informational.

LEDs

P-SEL	Green – Primary link selected.
	Black – Primary link deselected.
S-SEL	Green – Secondary link selected.
	Black – Secondary link deselected.
P-RX	Green – Primary link fiber OK.
	Black – No Ethernet data flowing.
S-RX	Green – Primary link fiber faulty.
	Black – Secondary link fiber faulty.

Software Upgrading/Downloading

General

Software can be upgraded/downloaded into the LambdaDriver in either of the following modes:

- LambdaDriver as TFTP client
- LambdaDriver as TFTP server



Note

Upgrading/downloading does not affect LambdaDriver operation or user-configured settings.

Requirements

- LambdaDriver IP Address[5].
- TFTP Server having a TFTP program and the file containing the operative program to be downloaded to the LambdaDriver.
- TFTP Server IP Address (if LambdaDriver is to be set as client).
- TFTP File Name; i.e., name of file containing the operative program to be downloaded to the LambdaDriver.

Procedure

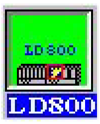
1. Make sure you have logged in as a supervisor as follows:

   i. Double click the icon 
   .

   ii. Follow the prompts until the login window (Figure 1) opens.

   iii. Select Supervisor.

   iv. Type the password in the Enter Password: field and click OK or press **Enter** key to open the Map Level window (Figure 2).

2. Double click the LambdaDriver icon 

to open the device zoom window (Figure 3).
3. From the **Device** menu, open the **Device Configuration** window (Figure 4).
4. Make sure that all settings in the window are correct. In particular, ensure that the **TFTP Process Enable** and **DownLoad from Application** is selected.
5. Click OK or press **Enter** key to start the download.

After upgrading/downloading is completed, the LambdaDriver automatically performs reset to run the new software. Reset retains the user-configured settings; it does *not* change them into the default settings.

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[5] Once an IP address is assigned to the LD800, it can be changed at a TELNET station with the command `set-ip`.)

Glossary

OA	A device that directly amplifies an optical signal without first converting it into an electrical signal.
OADM	Optical multiplexing device that enables a specific wavelengths to be added to or dropped from a WDM link while passing all other wavelengths to the next node on the link.
CWDM	A technology for multiplexing *widely* differing wavelengths on a single optical fiber. The range of wavelengths is typically 1470 to 1610 nm and the gap between the wavelengths are usually integral multiples of 20 nm.
DWDM	A technology for multiplexing *narrowly* spaced wavelengths on a single optical fiber. The wavelengths are in the infrared range, typically about 1550 nm and differ from one another usually by integral multiples of 0.2 to 1.6 nm.
Transponder	Device for converting a wave of one specific wavelength into a wave of a different wavelength.
OSC	An optical channel for carrying management data between two WDM nodes. The wavelength of the channel is different from those of the WDM channels. The traffic in the OSC is multiplexed along with the traffic in the WDM channels on the same physical fiber.
Virtual Fiber	A virtual fiber is infrared light of a specific wavelength. In the LambdaDriver, the virtual fibers are selected in the 1550 nm region for maximum operating distance through fiber.